

## EMERGENT WETLAND HABITATS NARRATIVE

### Habitat description

Wetlands are areas where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al.

*Emergent herbaceous wetlands* are areas where perennial herbaceous vegetation accounts for 75 to 100 percent of the cover and the soil or substrate is periodically saturated with or covered with water.

### Problems affecting species and habitats

#### Species threats

Respondents ranked the following threats to wildlife in emergent wetland habitats in Indiana:

Rank	Threats to wildlife in emergent wetland habitats
1	Habitat loss (breeding range)
2	Habitat loss (feeding/foraging areas)
3	Bioaccumulation of contaminants
4	Dependence on irregular resources (cyclical annual variations) (e.g., food, water, habitat limited due to annual variations in availability)
5	Predators (native or domesticated)
6 (tie)	Invasive/non-native species
6 (tie)	High sensitivity to pollution
7	Diseases/parasites (of the species itself)
8	Species overpopulation
9	Genetic pollution (hybridization)
10	Unintentional take/ direct mortality (e.g., vehicle collisions, power line collisions, by-catch, harvesting equipment, land preparation machinery)
11	Regulated hunting/fishing pressure (too much)

Respondents offered additional threats to wildlife in emergent wetland habitats in Indiana (not ranked):

- Continued loss and degradation of emergent wetland habitat in portions of state due to development and poor agricultural practices
- Human interaction with some wildlife species: trapping, relocation, scaring
- Reproductive intervention by humans
- Devaluing of some wildlife species due to overpopulation
- Restricted management options

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Respondents listed top threats to wildlife in emergent wetland habitats in Indiana (not ranked):

- Agricultural practices/development/urbanization:
  - Loss of shallow marshes due to drainage
  - Loss of winter feed due to fall tillage
- Habitat loss through annual cycle
- Predators
- Degradation of habitat by invasive plant species
- Water Quality
- Human intervention during nesting process
- Overpopulation/disease
  - Possible disease outbreaks due to large concentrations of birds often in small areas
- Continuing loss and/or degradation of emergent wetlands

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to wildlife in emergent wetland habitats. There were no responses.

### Habitat threats

Respondents ranked threats to emergent wetland habitats in Indiana:

Rank	Threats to emergent wetland habitats
1	Commercial or residential development (sprawl)
2 (tie)	Agricultural/forestry practices
2 (tie)	Habitat degradation
3	Habitat fragmentation
4 (tie)	Nonpoint source pollution (sedimentation and nutrients)
4 (tie)	Stream channelization
4 (tie)	Counterproductive financial incentives or regulations
5	Invasive/non-native species
6	Drainage practices (stormwater runoff)
7	Point source pollution (continuing)
8 (tie)	Successional change
8 (tie)	Impoundment of water/flow regulation
9	Residual contamination (persistent toxins)
10	Mining/acidification
11	Diseases (of plants that create habitat)
12	Climate change

Respondents noted other threats to emergent wetland habitats in Indiana (not ranked):

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- Drainage of wetlands
- Legal jurisdiction issues currently unclear; draft of state isolated wetland law out for comment

Respondents listed top threats to emergent wetland habitats in Indiana (not ranked):

- Commercial and residential development; road construction
- Stream and lake renovation have degraded habitat back to where it was when the original habitat destruction occurred
- Agricultural practices
- Drainage practices
- Degradation of plant community by exotic plants invading wetland habitats.
- Destruction of nesting trees
- Canada Geese are their own worst enemy. Concentrations of large numbers on small wetlands can pollute the water and cause increased erosion due to their feeding habits

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the threats to emergent wetland habitats. Their responses included:

- Invasive species threats are more important than they are ranked.

## Additional research and survey efforts

### Current body of research

#### Species research

Half of respondents stated that the current body of science is adequate or complete, up to date and extensive for wildlife in emergent wetland habitats in Indiana. Half of respondents stated that the current body of science is inadequate or nonexistent.

Respondents identified the following citations (title, author, date, publisher) that would give the best overview of wildlife in emergent wetland habitats in Indiana.

Title = Spring Breeding Duck Survey;  
Author = Kristen Chodachek;  
Date = 2003;  
Publisher = IDNR

Title = Waterfowl Ecology & Management;  
Author = Compiled by: Ratti, Flake, Wentz;  
Date = 1982;  
Publisher = The Wildlife Society

Title = The Birds of Indiana;  
Author = Russel E. Mumford, Charles E. Keller;  
Date = 1984;  
Publisher = Indiana University Press

Title = Atlas of Breeding Birds of Indiana;  
Author = John S. Castrale, Edward M. Hopkins, Charles E. Keller;  
Date = 1998;  
Publisher = Indiana Department of Natural Resources

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Title = Managing Canada Geese in Urban Environments;  
Author = Arthur E. Smith, Scott R. Craven and Paul D. Curtis;  
Date = 1199;  
Publisher = Cornell Cooperative Extension

Title = Prevention and Control of Wildlife Damage;  
Date = 1994;  
Publisher = University of Nebraska

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current body of science for wildlife in emergent wetland habitats. Their responses included:

- Canada Goose Environmental Impact Statement

Ducks, Geese, and Swans of North America  
Frank C. Bellrose  
1976

### Habitat research

Three quarters of respondents stated that the current body of science is adequate for emergent wetland habitats in Indiana. One quarter said that it is nonexistent.

Respondents identified the following citations (title, author, date, publisher) that would give the best overview of emergent wetland habitats in Indiana.

Title = Waterfowl & Wetlands- Integrated Review;  
Author = Edited : Bookhout;  
Date = 1979;  
Publisher = The Wildlife Society

Title = Creating Freshwater Wetlands;  
Author = Hammer;  
Date = 1997;  
Publisher = CRC Press

Title = Managing Canada Geese in Urban Environments;  
Author = Arthur E. Smith, Scott R. Craven and Paul D. Curtis;  
Date = 1999;  
Publisher = Cornel Cooperative Extension

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the current body of science for emergent wetland habitats. Their responses included:

- Wetlands 2nd ed. 1993  
Mitch and Gosselink  
Van Nostrand Reinhold

### **Research needs**

#### Species research

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Respondents ranked research needs for wildlife in emergent wetland habitats in Indiana:

Rank	Research needs for wildlife in emergent wetland habitats
1	Limiting factors (food, shelter, water, breeding sites)
2	Threats (predators/competition, contamination)
3	Distribution and abundance
4	Relationship/dependence on specific habitats
5	Population health (genetic and physical)
6	Life cycle

Respondents noted additional research needs for wildlife in emergent wetland habitats in Indiana (not ranked):

- To justify extending or modifying hunting seasons to eliminate the problem of the so-called nuisance goose in urban areas, around lakes and golf courses
- Food availability throughout annual cycle
- Ways to deter use
- Impact of high snow goose populations on Canada geese nesting sites
- Develop more effective dispersal, relocation or removal techniques for maxima geese

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for wildlife in emergent wetland habitats. Their responses included:

- Need to determine movement patterns of nuisance geese. If they never leave the urban areas hunting will not be a viable management option to control populations. Allowing hunting on golf courses might be an option but you have to convince the golf course manager to allow it. In Michigan there are very few golf courses that allow people to hunt on them.

Snow goose populations are not high enough in Indiana to affect Canada geese nesting sites. Snow geese do not even nest in Indiana.

### Habitat research

Respondents ranked research needs for emergent wetland habitats in Indiana:

Rank	Research needs for emergent wetland habitats
1 (tie)	Distribution and abundance (fragmentation)
1 (tie)	Threats (land use change/competition, contamination/global warming)
2	Growth and development of individual components of the habitat

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- 3 Successional changes
- 4 Relationship/dependence on specific site conditions

Respondents noted additional research needs for emergent wetland habitats in Indiana (not ranked):

- Habitat needs should be researched in an attempt to find and propagate habitats that are aesthetically pleasing to humans for urban settings yet displeasing for geese
- Availability throughout annual cycle

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the research needs for emergent wetland habitats. Their responses included:

- Invasive species research.
  - how wide spread
  - control methods

## Conservation actions necessary

### Species actions

Respondents ranked conservation efforts by how well they address threats to wildlife in emergent wetland habitats in Indiana:

Rank	Conservation efforts for wildlife in emergent wetland habitats
1 (tie)	Reintroduction (restoration)
1 (tie)	Stocking
2	Regulation of collecting
3 (tie)	Habitat protection
3 (tie)	Food plots
3 (tie)	Protection of migration routes
4	Disease/parasite management
5	Population management (hunting, trapping)
6 (tie)	Limiting contact with pollutants/contaminants
6 (tie)	Native predator control
6 (tie)	Public education to reduce human disturbance
6 (tie)	Exotic/invasive species control
6 (tie)	Translocation to new geographic range
6 (tie)	Culling/selective removal
6 (tie)	Threats reduction

Respondents noted no other current conservation practices for wildlife in emergent wetland habitats in Indiana.

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Respondents recommended these practices for more effective conservation of wildlife in emergent wetland habitats in Indiana (not ranked):

- Restoring wetlands and providing quality upland nesting cover adjoining these wetlands
- Habitat protection throughout annual cycle
- Continue five-year surveys
- Modify hunting seasons and opening of urban areas to hunting to reduce numbers of so-called nuisance geese populations in lieu of nest destruction and egg shaking
- Enhancement of migratory/staging habitat
- Enhancement of breeding habitat where populations do not conflict with land use
- Develop practices and procedures to increase harvest of local birds

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the practices for more effective conservation for wildlife in emergent wetland habitats. Their responses included:

- I'm not sure about what species are being stocked. Fish should not be stocked in emergent wetlands.

Exotic/invasive species control should be higher on the list.

If translocation refers to Canada Goose removal studies need to show they do not come back to the original site.

In many urban areas nest destruction and egg shaking are going to be the only means of reducing the number of geese. You cannot open urban areas to hunting.

### Habitat actions

Respondents ranked conservation efforts by how well they address threats to emergent wetland habitats in Indiana:

<b>Rank</b>	<b>Conservation efforts for emergent wetland habitats</b>
1	Habitat protection on public lands
2	Cooperative land management agreements (conservation easements)
3	Habitat restoration on public lands
4 (tie)	Succession control (fire, mowing)
4 (tie)	Land use planning
5 (tie)	Protection of adjacent buffer zone
5 (tie)	Habitat restoration through regulation
5 (tie)	Corridor development/protection
6 (tie)	Habitat protection incentives (financial)
6 (tie)	Habitat restoration incentives (financial)
6 (tie)	Artificial habitat creation (artificial reefs, nesting platforms)

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- 7 Managing water regimes
- 8 Habitat protection through regulation
- 9 (tie) Restrict public access and disturbance
- 9 (tie) Technical assistance
- 10 (tie) Selective use of functionally equivalent exotic species in place of extirpated natives
- 10 (tie) Pollution reduction

Respondents listed no additional conservation practices for emergent wetland habitats in Indiana.

Respondents recommended the following practices for more effective conservation of emergent wetland habitats in Indiana (not ranked):

- Habitat regulations
  - To protect small wetlands
- Habitat incentives
  - Restoration programs for private landowners (financial help)
  - Protection incentives
  - Easements on private lands to protect existing wetlands or restore wetlands
- Continue efforts to protect and enhance wetland and riparian habitats
- Control plant species, such as cattail, that spread by vegetative means from thick colonies
- Food plots
- Refuge areas

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the practices for more effective conservation of emergent wetland habitats. Their responses included:

- Need to protect private land.

## Proposed plans for monitoring

### Current monitoring

#### Species monitoring

Respondents were aware of the following monitoring efforts by state agencies for wildlife in emergent wetland habitats in Indiana (not ranked):

- Statewide year-round monitoring
- Statewide once-a-year monitoring
- Periodic statewide (less than once a year but still regularly scheduled) monitoring
- Occasional statewide (less than once a year and not regularly scheduled) monitoring
- Regional or local year-round monitoring
- Regional or local once-a-year monitoring
- Periodic regional or local (less than once a year but still regularly scheduled) monitoring
- Occasional regional or local (less than once a year and not regularly scheduled) monitoring

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Respondents were aware of the following monitoring efforts by other organizations for wildlife in emergent wetland habitats in Indiana (not ranked):

- Statewide once-a-year monitoring
- Periodic statewide (less than once a year but still regularly scheduled) monitoring
- Occasional statewide (less than once a year and not regularly scheduled) monitoring
- Regional or local once-a-year monitoring
- Periodic regional or local (less than once a year but still regularly scheduled) monitoring
- Occasional regional or local (less than once a year and not regularly scheduled) monitoring

Respondents ranked monitoring efforts by state agencies based on their importance for conservation of wildlife in emergent wetland habitats in Indiana:

<b>Rank</b>	<b>Monitoring efforts by state agencies for conservation of wildlife in emergent wetland habitats</b>
1	Statewide year-round monitoring
2 (tie)	Statewide once-a-year monitoring
2 (tie)	Regional or local year-round monitoring
3	Regional or local once-a-year monitoring
4	Periodic statewide (less than once a year but still regularly scheduled) monitoring
5 (tie)	Periodic regional or local (less than once a year but still regularly scheduled) monitoring
5 (tie)	Occasional statewide (less than once a year and not regularly scheduled) monitoring

Respondents ranked monitoring efforts by other organizations based on their importance for conservation of wildlife in emergent wetland habitats in Indiana:

<b>Rank</b>	<b>Monitoring efforts by other organizations for conservation of wildlife in emergent wetland habitats</b>
1	Statewide once-a-year monitoring
2	Statewide year-round monitoring
3 (tie)	Regional or local year-round monitoring
3 (tie)	Periodic regional or local (less than once a year but still regularly scheduled) monitoring
3 (tie)	Occasional regional or local (less than once a year and not regularly scheduled) monitoring
4	Regional or local once-a-year monitoring
5	Periodic statewide (less than once a year but still regularly scheduled) monitoring

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Respondents listed regional or local monitoring by state agencies for wildlife in emergent wetland habitats in Indiana (not ranked):

- Currently only when a permit for work in a wetland is applied for (smaller, more numerous wetlands have little oversight)
- IDNR: Selected fish and wildlife areas and reservoir properties conduct counts during fall migration period
  - As part of weekly waterfowl survey from August to January
- At selected sites
  - Weekly and mid-winter waterfowl counts
- Statewide for existing and new colonies every five years
- Neck collar observations statewide as encountered

Respondents listed regional or local monitoring by other organizations for wildlife in emergent wetland habitats in Indiana (not ranked):

- Some wildlife species are not monitored. Habitat changes requiring permits are checked by IDNR, IDEM and ACOE (in some cases)
- Lake associations, businesses and anyone living around an emergent wetland. Those that have yards and Canada goose complaints will monitor populations to prove they have a problem so they can destroy nests or eggs
- Christmas bird count

Respondents listed organizations that monitor wildlife in emergent wetland habitats in Indiana (not ranked):

- Waterfowl USA
- Ducks Unlimited
- The Nature Conservancy
- IDNR – Division of Fish and Wildlife
- IDNR – Division of Reservoirs
- Audubon Society
- U.S. Fish and Wildlife Service

Respondents considered monitoring techniques for wildlife in emergent wetland habitats in Indiana:

Monitoring techniques for wildlife in emergent wetland habitats	Used	Not used but possible with existing technology and data	Not economically feasible
Radio telemetry and tracking	X	X	--
Modeling	X	X	--
Coverboard routes	--	X	--
Spot mapping	X	--	--
Driving a survey route	X	--	--

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Reporting from harvest, depredation, or unintentional take (road kill, by-catch)	X	--	--
Mark and recapture	X	X	X
Professional survey/census	X	--	--
Volunteer survey/census	X	--	--
Trapping (by any technique)	X	--	--
Representative sites	X	--	--
Probabilistic sites	X	X	--

Respondents noted other monitoring techniques for wildlife in emergent wetland habitats in Indiana (not ranked):

- Aerial surveys

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for wildlife in emergent wetland habitats. There were no responses.

### Habitat inventory and assessment

Respondents were aware of the following inventory and assessment efforts by state agencies for emergent wetland habitats in Indiana (not ranked):

- Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
- Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
- Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment

Respondents were aware of the following inventory and assessment efforts by other organizations for emergent wetland habitats in Indiana (not ranked):

- Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
- Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment

Respondents ranked inventory and assessment efforts by state agencies based on their importance for conservation of emergent wetland habitats in Indiana:

Rank	Inventory and assessment by state agencies for conservation of emergent wetland habitats
1	Statewide annual inventory and assessment
2 (tie)	Statewide once-a-year inventory and

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- assessment
- 2 (tie) Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
  - 2 (tie) Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
  - 2 (tie) Regional or local year-round inventory and assessment
  - 3 (tie) Regional or local once-a-year inventory and assessment
  - 3 (tie) Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment
  - 3 (tie) Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment

Respondents ranked inventory and assessment efforts by other organizations based on their importance for conservation of emergent wetland habitats in Indiana:

Rank	Inventory and assessment by other organizations for conservation of emergent wetland habitats
1 (tie)	Periodic statewide (less than once a year but still regularly scheduled) inventory and assessment
1 (tie)	Occasional regional or local (less than once a year and not regularly scheduled) inventory and assessment
2 (tie)	Occasional statewide (less than once a year and not regularly scheduled) inventory and assessment
2 (tie)	Regional or local year-round inventory and assessment
2 (tie)	Statewide year-round inventory and assessment
2 (tie)	Regional or local once-a-year inventory and assessment
3	Statewide once-a-year inventory and assessment
4	Periodic regional or local (less than once a year but still regularly scheduled) inventory and assessment

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Respondents listed regional or local inventory and assessment by state agencies for emergent wetland habitats in Indiana (not ranked):

- On state land
- Isolated wetlands law

Respondents listed regional or local inventory and assessment by other organizations agencies for emergent wetland habitats in Indiana (not ranked):

- Indiana wetland inventory maps
- County aerial maps for NRCS
- Soils mapping county maps

Respondents listed organizations that monitor emergent wetland habitats in Indiana (not ranked):

- U.S. Fish and Wildlife Service
- Natural Resources Conservation Service
- Indiana Department of Environmental Management

Respondents considered inventory and assessment techniques for emergent wetland habitats in Indiana:

<b>Inventory and assessment techniques for emergent wetland habitats</b>	<b>Used</b>	<b>Not used but possible with existing technology and data</b>	<b>Not economically feasible</b>
GIS mapping	X	X	--
Aerial photography and analysis	X	X	--
Systematic sampling	X	X	--
Regulatory information	X	--	--
Participation in land use programs	X	X	--
Modeling	X	X	--
Voluntary landowner reporting	X	X	--

Respondents listed no additional inventory and assessment techniques for emergent wetland habitats in Indiana.

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for emergent wetland habitats. There were no responses.

### **Recommended monitoring** Species monitoring

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Respondents recommended the following monitoring techniques for effective conservation of wildlife in emergent wetland habitats in Indiana (not ranked):

- Aerial surveys
- Banding
- Continue current state surveys every 5 years
- Mark and recapture: A means to track species movement and association with non-target species and times of interaction with non-target species
- Mark and harvest: Eliminates and reduces concentrations in undesirable areas
- Banding and neck collaring: Procedures in place, nationally accepted, good national data base maintained
- Weekly waterfowl counts at selected sites: Samples most of the major concentration areas. Very good historical data for trend analysis
- Nesting and brood counts statewide

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the monitoring techniques for effective conservation of wildlife in wildlife in emergent wetland habitats. There were no responses.

### Habitat inventory and assessment

Respondents recommended the following inventory and assessment techniques for effective conservation of emergent wetland habitats in Indiana (not ranked):

- Aerial surveys and photos:
  - Wetlands should be monitored by overhead photo methods with ground truth checks. This should occur on a regular basis with aggressive enforcement against illegal wetlands destruction
  - Analysis of county aerial photos as these are done on a somewhat regular basis
- GIS mapping would be the most cost affective means for creating an inventory of emergent plant species that would support Canada Geese in emergent wetlands
- Systematic water sampling of high use areas would determine nutrient loading and water quality regarding Canada geese. (U.S. Fish and Wildlife Service Draft Environmental Impact Statement, Resident Canada Goose Management, February 2002)
- Reports from state FWAs
- Updating and ground-truthing Wetland Inventory maps

Technical experts and conservation organizations reviewed the above results and were asked if these were a reasonable representation of the inventory and assessment techniques for emergent wetland habitats. There were no responses.

Technical experts and conservation organizations offered the following additional comments:

- Protection of this habitat is critical for nesting and migrating waterfowl.